West Nile Virus Surveillance Summary
Kentucky 2001

Introduction

Kentucky prepared to increase surveillance for West Nile virus through a cooperative initiative involving the Kentucky Department for Public Health (KDPH), the Kentucky Department of Fish and Wildlife Resources (KDFWR), the Kentucky Department of Agriculture (KDA) and the United States Department of Agriculture (USDA). The KDPH granted a contract to the University of Kentucky Livestock Disease Diagnostic Center (UKLDDC) for West Nile virus testing of wild birds, mosquito pools and equines. The KDPH Division of Laboratory Services provided serology testing for human specimens. The KDPH Division of Epidemiology and Health Planning expanded their surveillance capability by adding an environmental biologist to the staff in early April.

Activities Provided by Each Agency

Kentucky Department for Public Health

In May 2001 a West Nile virus fact sheet was developed and placed on the public health website to assist health department employees, other state employees and the general public in reporting of dead birds and requesting testing for West Nile virus.

The newly employed environmental biologist completed mosquito speciation and mosquito trapping training provided by the Centers for Disease Control and Prevention (CDC). Two local health department employees and one technician from the UKLDDC also received this training. The environmental biologist worked with the two counties that had previously trapped mosquitoes to expand their capabilities and trained environmentalists in several other counties to begin mosquito trapping. New mosquito traps were purchased and provided to participating health departments for their use.

West Nile virus case definitions and laboratory testing information were sent to over 3000 physicians, laboratory directors, infection control professionals, and health department surveillance personnel. Information on dead bird reporting and equine testing was sent to veterinarians, county extension agents and health department environmentalists.

KDPH contracted with UKLDDC to do West Nile testing on bird specimens, equine tissue specimens and mosquito pools and with the Murray State University (MSU) Breathitt Veterinary Center to accept samples and forward to UKLDDC.

The Division of Epidemiology and Health Planning (DEHP) as the lead agency in surveillance of infectious diseases of humans maintained the surveillance data from the human, equine, dead bird and mosquito pools testing. This data was maintained in ArboNet, an electronic arbovirus surveillance tool designed by the CDC. The data was electronically submitted to the CDC to be included in Morbidity and Mortality Weekly Reports (MMWR) and the National West Nile Maps.

The DEHP handled consultations from the medical community, private citizens and the news media on West Nile virus and served as a backup on dead bird questions when the KDFWR personnel were out of the office.

Local health department environmentalists assisted with accepting bird specimens and forwarding them on through the KDFWR or by postage paid mailing cartons to the laboratory for testing.

Kentucky Department of Fish and Wildlife Resources

The KDFWR allowed use of their 800 line for dead bird reports and the wildlife biologist screened these calls, recommending testing on appropriate specimens. He also developed a dead bird report form that was on the KDFWR web page and maintained the data on all dead bird reports for this surveillance effort. KDFWR private land biologists assisted with the collection and submission of specimens from across the state.

Kentucky Department of Agriculture and the United States Department of Agriculture

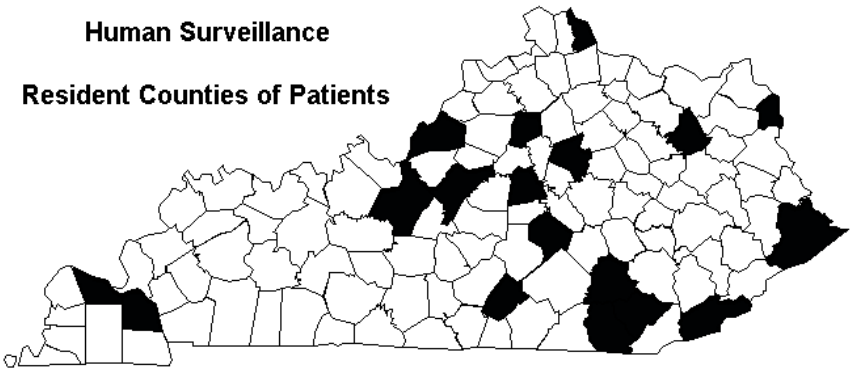
These departments worked with veterinarians on surveillance issues for West Nile virus and the collection of specimens for testing. They investigated equine encephalitis cases and followed up on all positive equine laboratory specimens with an investigation.

The USDA developed a laboratory guideline that was distributed to equine practitioners for proper sample submission. They also assisted with dead bird submissions and phone consultations.

Surveillance Results

Human Surveillance

Specimens from 33 patients were submitted for arboviral (LaCrosse, St. Louis Encephalitis, Eastern Equine Encephalitis and West Nile Encephalitis) testing. Samples were submitted from the end of April through November for testing. Most of the samples counted in this surveillance system went through the KDPH Division of Laboratory Services; a few went to commercial laboratories. These patients were from 18 Kentucky counties and all were negative for arboviruses.

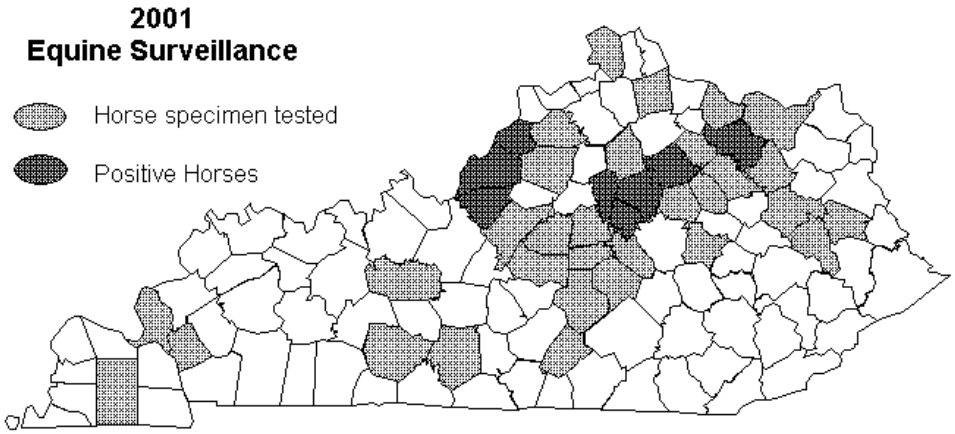


Equine Surveillance

Early in the season most of the samples submitted were from symptomatic horses. Samples were either cerebrospinal fluid, serum or necropsy tissues. After the first positive was confirmed more samples were received from asymptomatic horses for various reasons. Results were received on 146 equines from 39 Kentucky counties. Samples were submitted from the end of April through the end of December. Equine serology samples were forwarded to the National Veterinary Services Laboratory in Ames, Iowa. The UKLDDC performed polymerase chain reaction (PCR) testing for West Nile virus on necropsy tissue.

The eight positive horses were symptomatic and tested between the third week of August and the fourth week of October, a ten-week period. Even though all eight positive horses were symptomatic only three of the horses met the standards of the CDC equine surveillance case definition for West Nile virus. Two of these were positive on the IgM-capture ELISA and also positive on virus neutralization (VN) at >1:100. The third horse in this category was confirmed by virus isolation. Three of the other five symptomatic horses were positive on PCR to West Nile virus and two were positive on virus neutralization (VN) at >1:100. Six of the positive horses either died or were euthanized because of the severity of their symptoms.

Only one of the 8 horses considered positive by the Kentucky surveillance group had been vaccinated with the West Nile equine vaccine and it was one that met the CDC case definition. The complete vaccination history on this horse was not available.



Bird Surveillance

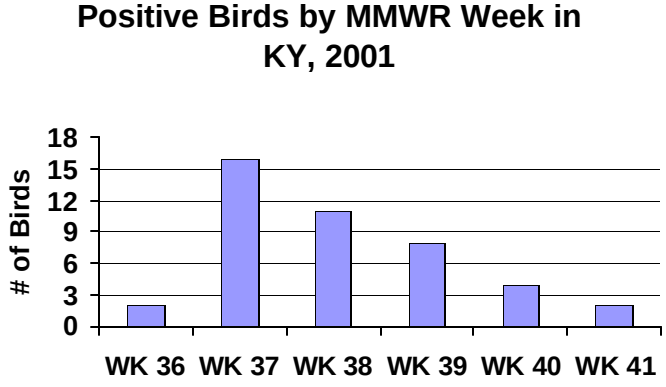
A wildlife biologist with the KDFWR maintained the data on wild birds that were reported by either telephone or by submitted report form. Information was collected as to the location of the bird, species, date found and whether it was submitted for testing at the laboratory or was not suitable for testing. Birds were transported to the laboratory by the biologists, local health department staff or by mail using returnable mailing cartons. An epidemiologist at the KDPH Division of Epidemiology and Health Planning maintained the data on West Nile test results.

Eighty-eight counties reported or submitted dead birds. Sparrows and robins were the most frequently reported dead birds, followed by mourning doves, grackles and blue jays. Only 33 crows were reported and 30 of these were tested. Birds were submitted and tested at the UKLDDC from the last week of February through November.

Bird Surveillance for 2001

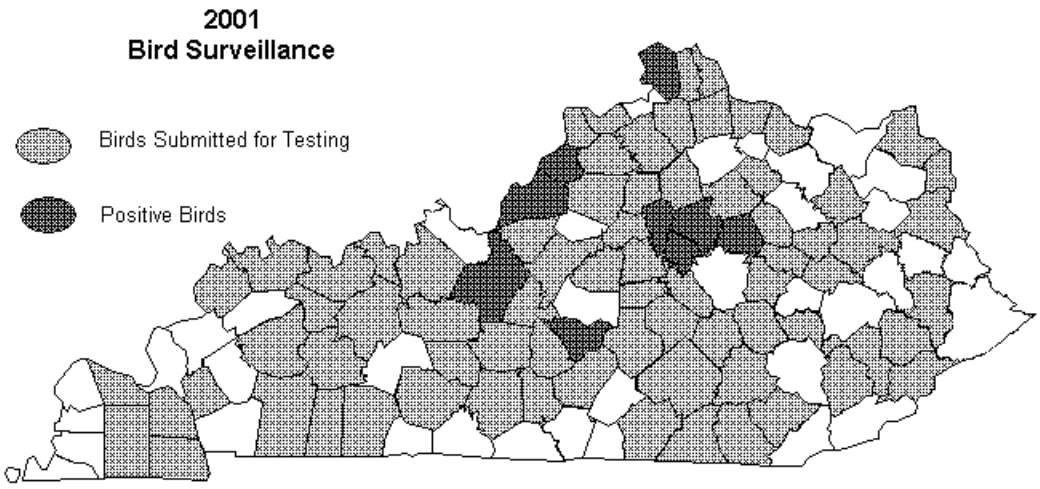
Species	# Reported	# Tested
Crows	33	30
Other species	857	507

Forty-three birds were positive by PCR for West Nile virus at the UKLDDC. One specimen from Daviess County was not confirmed as positive on follow-up testing. Positive birds came from 9 counties, with 28 of the positives from Jefferson County and 8 from Fayette County. The remaining 7 counties had a single positive bird. The positive birds were of the following species; cardinal (1), house finch (1), crow (14), blue jay (9), song sparrow (2), house sparrow (4), common grackle (3), European starling (1), robin (5), and non-identified species (3). The earliest submission of a positive bird to UKLDDC was September 5 and the last positive was submitted on October 10, 2001.



MMWR # 36 (September 2 –September 8)

Approximately 20 counties submitted only one bird for testing. Seventeen counties submitted between 5 and 20 birds for testing and 3 counties submitted over 20 birds. Fayette and Jefferson counties both submitted over 100 birds for testing. Twenty-eight counties reported dead birds but did not submit any for testing.



Mosquito Surveillance

Nine counties, as shown in Table 1, participated in mosquito sampling for West Nile virus surveillance in 2001. They used one CDC light trap and one gravid trap per site, trapping once a week through the first week of October. Fayette and Jefferson Counties began their second year of trapping in mid June. The other counties were added in 2001 to enhance mosquito surveillance in Kentucky. Rowan County began collecting mosquitoes the third week in July, and Boone and Campbell counties, the last week of July. Allen, Barren, Logan, and Warren counties began trapping the last week of August. There were 5242 mosquitoes collected representing 25 different species. The mosquitoes were tested by PCR in pools of no more than 50 per species per county. Positive mosquito pools were identified in Jefferson and Fayette counties (see Table 2).

Table 1: Counties Doing Mosquito Trapping in 2001

County	Total Mosquitoes	Total Number Of Sites	Number of Different Species	Most Abundant Species
Allen	38	1	4	30 Aedes albopictus
Barren	126	4	10	40 Aedes albopictus
Boone	69	5	12	19 Aedes albopictus
Campbell	148	4	13	50 Culex species
Fayette	1782	6	17	627 Culex pipiens
Jefferson	2670	8	15	1100 Culex species
Logan	87	1	6	60 Culex species
Rowan	239	6	9	145 Culex pipiens/restuans
Warren	83	2	6	44 Aedes albopictus

Table 2: Positive Mosquito Pools

Date	County	Species
MMWR 36 (ending Sept. 8)	Jefferson	Culex pipiens/restuans
	Fayette	Culex pipiens/restuans
MMWR 37 (ending Sept. 15)	Jefferson	Culex species & Culex pipiens
	Fayette	Culex species
MMWR 38 (ending Sept. 22)	Jefferson	Culex species

All species collected and identified in Kentucky during the 2001 season are identified in Table 3.

Table 3: Mosquito Species Identified in KY in 2001

Scientific Name	Collected	Tested
Aedes albopictus	958	958
Aedes sp. / Ochlerotatus sp.	91	91
Aedes vexans	144	144
Anopheles barberi	1	1
Anopheles punctipennis	33	33
Anopheles quadrimaculatus s.l.	7	7
Anopheles sp.	1	1
Coquillettidia perturbans	1	1
Culex erraticus	15	15
Culex pipiens	1064	1064
Culex pipiens-restuans (Mixed)	1079	1079
Culex restuans	110	110
Culex salinarius	2	2
Culex sp.	1646	1646
Culex tarsalis	1	1
Culex territans	5	5
Ochlerotatus atropalpus	1	1
Ochlerotatus triseriatus	25	25
Ochlerotatus trivittatus	19	19
Orthopodomyia sp.	14	14
Psorophora columbiae	1	1
Psorophora ferox	3	3
Psorophora sp.	2	2
Uranotaenia sapphirina	1	1
Uranotaenia sp.	8	8

In the upcoming season, the surveillance group will train for improved collection techniques so that mosquito pools tested will be from individual collection sites. Additional areas of the state will be added to provide better surveillance statewide for arboviral diseases.

The West Nile virus surveillance data for 2001 indicates that the West Nile virus was active in the state from mid-August until mid-October. Numerous birds and equine specimens were tested after this time period with no positive results. The Kentucky data gained in 2001 is part of the National surveillance effort to understand the movement of this virus. Many factors influence the activity of mosquito borne diseases. Surveillance needs to continue and be expanded to provide useful guidelines for vector control and health education for avoidance and prevention.

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